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DISCUSSION PAPER

Provider altruism in health economics

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Abstract

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We propose a first comprehensive overview of the main theoretical notions and empirical findings on altruism among physicians and other healthcare providers. While altruism in the behavioral and experimental economics literature is typically defined as a deviation from purely self-interested behavior, the theoretical health economics literature embeds the notion of physician altruism within the doctor–patient relationship. The altruism of physicians is typically defined as the weight in the doctor's utility function attached to patient's health benefits, besides the self-interested monetary considerations. We broadly group the empirical evidence into five main categories of evidence, gradually moving from low to high control in the settings and empirical strategies: evidence from i) survey and interview data, ii) discrete choice experiments, iii) prescriptions records, iv) field experiments, and, finally, v) laboratory experiments. Across each of those groups of studies and different methods, the evidence generally supports the theoretical notion that physicians largely behave 'altruistically' in their healthcare decisions. Some studies indicate, however, considerable heterogeneity in physicians' altruistic preferences.

Keywords: altruism, incentives, health care providers

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Contents

1 Introduction

This paper proposes a first comprehensive overview of the various conceptualizations and empirical findings related to the notion of 'provider altruism' in health economics. Such a systematic assessment is needed because the existing theoretical and empirical literatures seem to interchangeably use different operational definitions of 'altruism', and to refer not just to physicians but also to nurses and other healthcare professionals. As we will document in this paper, the definition of altruism in the health economics literature is more specific and focused than the operational definition in the broader economics literature.

There are actually numerous streams of literature within health economics that have dealt with 'provider altruism' from different angles and perspectives. These different streams, however, have somehow proceeded in parallel, and have rarely been interlinked and systematically tied together. In particular, what is currently missing is a critical overview bridging insights from both theoretical models and the empirical evidence. The purpose of this review paper is to fill this gap.

The reviewed literature reveals a variety of approaches on how the theoretical constructs of altruism, as defined in (behavioral) economic theory, can be operationally applied to the specific case of healthcare providers. We compare the empirical evidence on altruism among healthcare providers while bringing together insights from surveys and observational studies, discrete choice experiments, drug prescriptions records, and more controlled field and laboratory experiments.

The remainder of the paper is organized as follows: Section 2 discusses the definitions of altruism in economics (2.1), and reviews the main empirical findings on altruism in behavioral and experimental economics (2.2). Section 3 discusses altruism in health economics from a theoretical perspective, by reviewing influential models (3.1) and their implications for the design of optimal healthcare governance and regulation (3.2). Section 4 discusses the evidence on altruism in health economics, and in particular reviews the evidence directly related to healthcare providers from survey data (4.1), discrete choice experiments (4.2), prescriptions records (4.3), field experiments (4.4), and laboratory experiments (4.5). Section 5 contains a discussion on the parallel and distinct literature on healthcare providers' intrinsic motivation, from both a theoretical and an empirical perspective. Finally, Section 6 discusses the main findings from a methodological perspective before giving a brief summary of conclusions.

2 Altruism in economics

2.1 General definition of altruism

Evidence from mainly experimental economics has shown that the self-interested hypothesis poorly predicts situational outcomes where individual choices have a direct influence on others' payoffs. This evidence has motivated the study of pro-social behavior in various game-theoretic and bargaining settings, as well as the exploration of alternative behavioral motivations such as altruism, fairness, cooperation, trust, and reciprocity (e.g., Andreoni, 1988; Forsythe et al., 1994; Berg et al. 1995; Camerer and Thaler, 1995; Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Fehr and Gächter, 2000, 2002; Ortmann et al., 2000; Andreoni and Miller, 2002; Charness and Rabin, 2002; Herrmann et al., 2008; Fischbacher and Gächter, 2010).

In particular, altruism in economics is generally defined as an *act that benefits another at one's own expense* (Nagel, 1970; Forsythe et al., 1994; Andreoni and Miller, 2002). As noted by Andreoni et al. (2007), for an act to be altruistic it must not only benefit the other at one's own cost but also be affected by the act's consequences for the other. Thus, a general account of altruism requires the consideration of two dimensions – that is, one dealing with the distribution of costs and benefits, and the other covering players' type and their motivations and interactions. In recent years, several theories and theoretical approaches have been developed to explain the observations of non-selfish behavior by using different formulations of the interrelations of the player types and motivations.

The conventional way of explaining altruistic behavior is to assume that altruistic motives are properties of individual preferences and that an individual behaves so as to satisfy her own preferences. In this way of modeling altruism, a person who behaves altruistically prefers that the other person's payoff is better rather than worse (see Gui and Sugden, 2005). A well-known model of such preferences is by Levine (1998). In this model, the utility payoff of a donor *d* when donating to a recipient *r* is given by

$$v_d = u_d + \frac{a_d + \lambda a_r}{1 + \lambda} u_r \tag{1.1}$$

where player *d* receives utility from his own material payoff and from the material payoff of player *r*. In addition, in the component weighting *r*'s material payoff in *d*'s preferences, a_d is *d*'s altruistic motivation ($a_d \in [0, 1]$), a_r is *d*'s perception of *r*'s altruistic motivation ($a_r \in [0, 1]$), and λ stands for how strongly *d* conditions her evaluation of *r*'s payoff on her perception of *r*'s type.[6]

The model shows that the higher a_d and a_r the more *d* values *r*'s payoff (assuming $\lambda > 0$). In other words, the more altruistic the donor is and the more 'good will' she sees in the recipient the more she receives utility from generous behavior towards the recipient, assuming that she conditions her behavior on the recipient's type. In this model, if $\lambda = 0$ the donor is *unconditionally altruistic*, while when $\lambda > 0$ she is *conditionally altruistic*. That is, if an agent is unconditionally altruistic, she gives independently of the respondent's type, motivation, or history (Fong, 2007; Kolm, 2005). In contrast, if the agent is conditionally altruistic, the strength of her altruism is influenced by the recipient's type, motivation, or history (Fong, 2007).

There are also other strategies for explaining altruistic behavior. One is to approach altruistic behavior as a situation where the interaction between the donor and the recipient involves reciprocity motives (see Rabin, 1993). This means that the donor is motivated to return the recipient's kindness (or unkindness). The unique idea is that utilities are defined on beliefs as well as on chosen actions. Still another strategy is to assume that when acting altruistically, people respond to other people's expectations, which they are motivated to meet. These expectations can be rooted in social norms (or conventions, practices or perceptible regularities). As Bicchieri and Xiao (2010) explain, such expec-

[6] In Levine's original model, $a_d \in [-1, 1]$ and $a_r \in [-1, 1]$ to allow for spiteful behavior.

tations can be either empirical or normative – that is, inducing us either to do as others do or do as others think we ought to do.

Two comments are in order. First, economists often make a distinction between pure and impure altruism. This is based on Andreoni's (1989) notion that, when transferring money or another 'good' to the other, people receive utility not only from one's own benefit and from the recipient's benefit but also from the very act of giving ('*warm glow*'). Hence, pure altruism refers to an altruistic act motivated solely by one's caring for the other's wellbeing, whereas impure altruism includes in addition the positive warm glow motive for altruism. Second, the models attempting to explain altruistic behavior are typically constructed to also take into account other behavioral motivations, including one's willingness to reduce the other's utility by punishing, or by responding to the other's 'ill will' with spiteful behavior (see, e.g., Levine, 1998; Fehr and Gächter, 2000).

2.2 Evidence on altruism from behavioral and experimental economics

Most economists' empirical research on altruism is carried out in laboratory or field experiments. The popular workhorses are strategic games such as the ultimatum game (UG) and the dictator game (DG). The original UG and DG games were proposed in the experimental studies of Güth et al. (1982) and Kahneman et al. (1986), respectively. By the early 2000s, several variations of these basic games had been thoroughly explored (see Camerer, 2003, Table 2.2 and Table 2.3; Andreoni et al., 2008). Though the evidence shows that there is (at least) seemingly altruistic behavior in these experiments and that the 'nature and strength' of altruism is influenced by certain contextual variables in the experiment, many questions still remain open. In addition, there are important methodological questions related to the interpretation and generalizability of experimental results.

In the UG the first of two players (the sender) proposes how to divide a sum of money between her and the second player. Then, the second player (the receiver) either accepts or rejects the proposal. In the case of acceptance, the money is divided according to the proposal, while in the case of rejection neither player receives anything. In the DG, the first player (the dictator) decides the allocation of money between herself and a second passive player, who simply receives her portion of the allocation. These games are simple and have unique (sub-game perfect) Nash equilibrium outcomes in pure strategies: In the UG, the second player accepts any non-zero offer, and the first player proposes the minimum possible non-zero offer; in the DG the dictator offers nothing to the second player. In those experimental games, altruism is typically measured as the empirical deviation from the purely self-interested Nash equilibria allocations.

At face value, the experimental outcomes of the basic versions of the UG and DG experiments are robust. In the UG experiments the modal and median offers are typically 40–50 percent and the means 30–40 percent of the initial endowment. Concerning the respondent behavior, the modal and mean offers are seldom rejected, and about half of offers below 20 percent are rejected (Camerer, 2003, Table 2.2 and Table 2.3). In the DG experiments, senders allocate about 20 percent of the money endowment to the receiver (Camerer, 2003, Table 2.4). These results have been traditionally interpreted as challenging the self-interest notion of traditional micro-economic theory. Recently, however, the overall picture has become more nuanced due to the volatility of the results, and their sensitivity to relatively minor changes in the experimental design (see List 2007; Zizzo 2011; Guala and Mittone 2010).

One reading of the DG is that the basic game is too 'thin' in the sense that the game lacks social context. Two obvious means of bringing such context is to manipulate whether or not 'hard work' or 'luck' are connected to the formation and distribution of the initial allocations between the players and, second, what background information is given to the sender concerning the characteristics of the receiver. The results of the experiments motivated by these questions can be summarized as follows:

(1) Several studies show that when either the money to be allocated or the role of the proposer is earned (in a contest or through a simple task), the mean allocation in the game decreases (Hoffman et al., 1994; Cherry et al., 2002; List, 2007; Jakiela, 2011). In contrast to these experiments (or treatments) where a norm of *hard work and diligence* is made salient, the baseline dictator game experiment involves the norm of *good luck*, as the roles of the pro-

poser and the receiver are assigned randomly. Random assignment of good luck is associated with a higher mean allocation.

(2) Several other studies show that the mean allocation is different in cases where anonymity holds than in cases where some information is given about the recipient. It has been documented that the mean allocation increases when (i) the dictator and the receiver are allowed to communicate or to send cheap talk messages (Xiao and Houser, 2005; Anderson et al., 2010); (ii) the name (or the photo) of the receiver is told (given) to the dictator (Schweitzer and Solnick, 1999); (iii) the receiver has a generous reputation (Servátka, 2010); (iv) the receiver is described as poor and/or in need of medical care (Brañas-Garza, 2006, 2007) or the receiver is a trusted organization such as the Red Cross (Eckel and Grossman, 1996). Cases (iii) and (iv) are examples of social acceptability, while case (iv) can be interpreted as a special case of deservingness.

An important methodological question arises from the DG experiments by List (2007), Bardsley (2008) and Cappelen et al., (2013) and the meta-studies of DG by Engel (2011) and Zhang and Ortmann (2014), where the focus is on the inclusion of a 'take-option' into the choice set of the dictator. The logic of these experiments is that if subjects have altruistic preferences (which generate altruistic behavioral patterns in dictator games) the addition of 'take-options' should not influence subjects' behavior. The results, however, show that the introduction of a 'take-option' in the DG significantly lowers the proportion of subjects who behave generously and also induces taking, rather than giving, behavior. On the other hand, as found by List (2007), not all subjects chose the most selfish outcome even when they have the 'take-options', indicating some degree of other-regarding consideration.

These outcomes have given rise to the following interpretations. First, Bardsley (2008) suggests that altruism in the DG is due to experimental demand effects. Second, List (2007) adds to this the change in subjects' expectations invoked by changes in the action set in the experiment, which has parallels in institutional features and social norms across environments outside the laboratory. Finally, Cappelen et al. (2013) suggest that in addition to experimenter demand effect, institutions and social norms, seemingly altruistic behavior could arise because of subjects' motivation to signal not being entirely selfish (an 'audience effect' in Andreoni and Bernheim, 2009). Similar results and interpretations have been proposed in other variants of the DG where the dictators are given a costly 'outside option' by which they can avoid facing the situation of dividing money between themselves and the receivers (Dana et al. 2006, 2007).

A final methodological question relates to the external validity of the altruism findings elicited through laboratory-based experimental games. There are surprisingly few studies which systematically investigate the external validity of the DG and UG laboratory games in general, and, as discussed in Section 3.5, almost no evidence for the external validity of DG and UG within the health context. Outside the health domain, few studies have compared behavior in specific laboratory-based experimental games with specific behavior in the field for the same pool of subjects. In the cases of DG and UG, all existing studies have found mixed evidence at best (Castillo and Carter, 2002; Benz and Meier, 2008; Barr and Zeitlin, 2010; Carpenter and Myers, 2010; Franzen and Pointer, 2013). A recent systematic laboratory–field experiment by Galizzi and Navarro-Martinez (2015) found no significant association between behavior in a battery of laboratory games, including the DG and UG, and individual behavior in a range of pro-social situations naturally occurring in the field (e.g. charitable giving, helping others). Laboratory behaviors in DG and UG games, moreover, are not significantly associated with self-reported measures of past social behavior either.

3 Altruism in health economics: theory

3.1 Physician altruism models

The analysis of physicians' behavior and decision-making has a central and noble tradition in health economics. The seminal paper by Arrow (1963)—arguably the first 'health economics' paper in history—examines the motives that differentiate physicians from purely profit-maximizing agents. In subsequent health economics modeling of physician behavior, it has become common to assume that the patient's health benefit appears as an argument in the physician's utility function with the interpretation that the physician has an altruistic concern for patient welfare (Ellis and McGuire, 1986; Woodward and Warren-Boulton, 1984; Farley, 1986).

Ellis and McGuire (1986) were among the first to formalize altruism in health care. They examined the decision-making of a physician acting as an agent for both a patient and a hospital. The physician is assumed to internalize the external effects of her decision-making on the hospital profit and the patient's health benefit. In their set-up the physician is interested in the hospital's profit because her salary is tied to the financial performance of the hospital.

Formally, the physician's utility function in Ellis and McGuire (1986) is $U(\pi(q),B(q))$, where $\pi(q)$ refers to the hospital's profit and $B(q)$ to the patient's health benefit. The variable q measures the amount of hospital services provided for the patient during a hospital episode.[7] Ellis and McGuire (1986) assumed a fully insured patient, which implies that $B(q)$ corresponds to the consumer surplus that the patient derives from accessing hospital services.

Ellis and McGuire (1986) define altruism as the physician's marginal rate of substitution of a patient's health benefit for hospital profits:[8]

$$MRS = \frac{\partial U / \partial B}{\partial U / \partial \pi} \equiv \alpha. \tag{1.2}$$

It is natural to assume that hospital profit and patient's health benefit are goods for the physician. Thus the degree of physician's altruism in (1.2) measures the amount of hospital profits the physician needs as a compensation for a marginal reduction in the patient's health benefit to maintain the same level of utility.

Much of the later literature (e.g. Chalkey and Malcolmson, 1998; Jack, 2005; Chone and Ma, 2011; Hennig-Schmidt et al., 2011; Godager and Wiesen, 2013; Makris and Siciliani, 2013) examining the effects of altruism in health care has used a linear and separable form of the physician's (health care provider more generally) utility function of the type:

$$U = \pi + \alpha B(q) = R - C(q) + \alpha B(q) \tag{1.3}$$

where R and $C(q)$ refer to the hospital revenue and costs, and the parameter $\alpha \geq 0$ denotes the degree of physician altruism towards the patient's welfare. This approach is in fact a special case of the general utility function used by Ellis and McGuire (1986), and α can be given a similar interpretation as in (1.2).

Finally, Chalkey and Malcomson (1998) and Jack (2005) use a utility function of the type:

$$U = \pi + \varphi(q), \tag{1.4}$$

[7] Alternatively, the variable could also refer to the quality of hospital services (see, e.g., Kaarboe and Siciliani 2011).

[8] Strictly speaking, the absolute value of the marginal rate of substitution is presented.

where q is either quality or quantity of healthcare, or both. The term $\varphi(q)$ may contain the patient's health benefit but other elements could also be included. For example, it may measure the physician's private valuation of the quality of health services or any utility that the physician derives from the provision of health services. The utility function (1.4) is hence more general than the linear utility function (1.3) with the altruistic component. In empirical work it is crucial that altruism can be separated from other forms of valuing care.

3.2 Consequences of altruism for regulation and governance

Formal models on altruism in health economics have been developed in parallel to the literature dealing with provider payment mechanisms (see for instance Ellis and McGuire, 1986; Chone and Ma, 2011). The analysis of Ellis and McGuire (1986) illustrates the fundamental importance of altruism in the design of optimal payment mechanisms in health care. They show that the cost reimbursement and prospective payment mechanisms imply either excessive or sub-optimal provision of hospital services. Ellis and McGuire also considered a mixed payment mechanism with hospital revenue:

$$R = \alpha + rC(q), \tag{1.5}$$

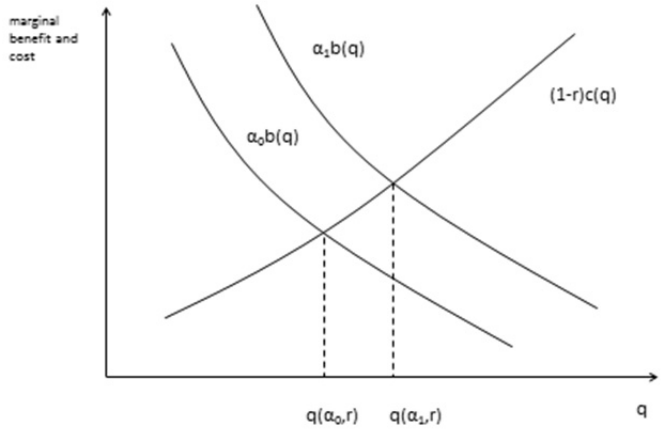
where α is a lump-sum payment and r defines the fraction of the hospital costs reimbursed by the payer. Denoting marginal health benefit and marginal cost $b(q)$ and $c(q)$, respectively, and using the utility function (1.3),[9] the first-order condition for a physician's treatment choice can be written as follows:

$$-(1-r)c(q) + \alpha b(q) = 0. \tag{1.6}$$

Figure 1, below, illustrates the optimal care provision and the impact of altruism on the supply of health care. Assuming the cost-reimbursement parameter r is given, the physician with a degree of altruism α_0 chooses the amount of health care $q(\alpha_0,r)$. Ceteris paribus, a more altruistic physician $(\alpha_1 > \alpha_0)$ chooses a higher amount of health care $q(\alpha_1,r)$. The effects of the cost-reimbursement can be examined similarly. A higher fraction of the hospital costs reimbursed by the regulator implies a lower marginal cost for the hospital, which consequently induces the physician to increase the provision of health care. Such a change would shift the hospital's marginal cost to the right in Figure 1.

[9] We also assume a strictly concave health benefit $B(q)$ and a convex cost $C(q)$ in q.

Figure 1: Utility-maximizing choice of the physician



Ellis and McGuire (1986) also show that, in order to achieve an efficient amount of health care services,[10] the payment mechanism must be designed to satisfy the condition:

$$r = 1 - \alpha. \tag{1.7}$$

Hence, the optimal rate of cost reimbursement is negatively related to the degree of physician altruism. The lower the α (implying less concern for the patient's health benefit), the higher is the optimal rate of cost reimbursement. Further, when the physician values hospital profits and the patient's benefit equally (i.e. $\alpha = 1$), the hospital payment should be a flat payment ($r = 0$). In this case a fully prospective payment implements the social optimum. In the special case where the physician does not value the patient's health benefit (i.e. $\alpha = 0$), the efficient provision of hospital services can only be achieved in the case of full cost reimbursement ($r = 1$).

Several theoretical papers since Ellis and McGuire (1986) have examined the role and implications of altruism in health care. For instance, Ma (1994) shows that, if a provider is partially altruistic and there is a positive demand response from care quality, the first-best levels of both quality-generating and cost-reducing efforts can be implemented by means of a single prospective payment parameter. Further, Chalkley and Malcomson (1998) show that if the physician attaches any positive value to the patient's health benefit, then a prospective payment will induce an optimal cost-reducing effort and some positive, but sub-optimal, level of quality. The optimal rate of supply-side cost-sharing (which motivate the first-best quantity in Ellis and McGuire, 1986) as well as the second-best solution in Chalkley and Malcomson (1998) depend on whether the patient's health benefit is part of the physician objective function.

Also the distribution of physician altruism in markets has a prominent role. Therefore more assumptions regarding physician altruism have been introduced in recent theoretical papers. For example, Ma and Riordan (2002) analyze health insurance and moral hazard in managed care with physician–patient interaction. Siciliani (2009) models the impact of performance pay on the provision of medical services when providers differ in their degree of altruism. Allard et al. (2011) investigate treatment and referral decisions of altruistic physicians under a gatekeeping regime. Common to these studies is the assumption that the physician's altruism is known.

[10] This is achieved when the marginal benefit of additional consumption equals the marginal cost of producing such hospital services.

The models by Jack (2005) and Choné and Ma (2011) introduce the combination of unknown and heterogeneous degrees of physician altruism. Jack (2005) analyzes the incentive mechanisms in the presence of asymmetric information about physicians' altruism. The provider's utility is positively related to quality of medical services, but this utility is unknown to the third-party payer. Jack (2005) shows that, when physician altruism is not contractible, incentive mechanisms need to be designed so that physicians reveal their altruistic types, and concludes that a non-linear scheme relating physicians' payment to incurred costs is optimal. Choné and Ma (2011) consider a model of asymmetric information where the purchaser does not know the patient's valuation of health benefit, nor the physician's weights on patient's health benefit and own profit.

Liu and Ma (2013) analyze the process of delegating decision-making to an altruistic physician. Here, the physician can either commit to treatment decisions at the time a payment contract is accepted, or can refrain from commitment and learn later about the patient's illness. Based on the physician's commitment, the first best is implemented by a single payment contract to all types of altruistic physicians. In the case without the physician's commitment, Liu and Ma (2013) show that the most altruistic physician earns a positive profit and that treatment decisions are distorted from the first best.

4 Altruism in health economics: evidence

Despite provider altruism being critically important from a theoretical perspective and in designing optimal regulation and governance schemes in healthcare, relatively little is known about physician altruism from an empirical perspective. The next sections provide an overview of the existing evidence on provider altruism in healthcare from different branches of the empirical literature.

The empirical evidence to date can be broadly grouped into five main categories of evidence, gradually moving from lowest to highest degrees of control in the empirical strategies: evidence from i) survey and interview data (4.1); ii) discrete choice experiments (4.2); iv) prescriptions records (4.3); v) field experiments (4.4); and, finally, vi) laboratory experiments (4.5).

4.1 Evidence on provider altruism from survey and interview data

Several systematic questionnaires have been designed to measure altruistic motivation in surveys. Penner et al., (1995) developed the Prosocial Personality Battery, comprising two factors: self-reporting of other-oriented empathy; and participation in helpful behaviours or activities. Blackall et al., (2007) developed the Penn State College of Medicine (PSCOM) Professionalism Questionnaire, which includes seven elements of professionalism including altruism.

An alternative test by Pawlikowski (2012) consists of a Scale of Attitudes towards the Patient (SAtP) assessing four dimensions: respect for autonomy, altruism, empathy, and holistic approach to a patient. González Gutiérrez et al., (2006) developed the Nursing Motives for Helping Scale (N-MHS), consisting of nine items. Among these, altruism is identified by response to items such as: (the nurse) '*tries to identify the receiver's needs and offers the most efficacious kind of help, obtaining all the necessary attention for the patient*'. Besides these general questionnaires, a number of ad-hoc surveys and interviews have been conducted in developing and developed countries in order to identify altruistic motivations among healthcare professionals.

A first group of studies refer to *nurses*. For example, a survey of 767 nurses in Norway revealed that '*human dignity*' and '*altruism*' were the most prominent moral values (Fagermoen, 2012). Another large survey of nurses in Belgium showed that '*altruism*' was a recurring concept (DeCooman, 2008). A survey with nurses and nursing students in Australia found that both groups were very high in '*altruistic ideals*' (Eley, 2012). Other investigators have found altruism to be ranked among the top three motivations (Altun, 2002; Pask, 2005; Bjerneld, 2006; Carolan, 2011; Crick, 2014).

Smith et al., (2012) include a survey to measure altruism as a test of the internal validity of their DG experiments with final-year *nursing students* (see more in Section 3.5). For altruism, the following statements were used: '*helping others with my time or money is very important to me*'; and '*personally assisting people in trouble is very important to me*.'

Similarly, Serra et al., (2010) included a survey to assess philanthropic motivation besides their DG experiments with *nursing and medical students* in Ethiopia (see Section 3.5). Students were asked to rank eight job characteristics according to their importance: 13 percent of the doctors and 34 percent of the nurses ranked the '*opportunity to help the poor*' as the most important job characteristic.

Regarding *medical students*, a survey conducted in 1981-1982 demonstrated that a typical USD School of Medicine student viewed their calling into medicine as primarily altruistic in nature (Kahler, 1991). Interviews with Peruvian medical students found a widespread expectation to be an '*altruistic*' doctor with '*social motivation*' (Perales, 2014). A similar outlook was identified in the UK among junior doctors and medical students who see medicine as defined by responsibility towards patients, requiring qualities such as altruism (Chard, 2006).

Regarding *physicians*, Allaby (2003) studied local doctors' motivation for serving in charitable clinics in urban Nepal. One of the three most frequently cited reasons for deciding to work in a charitable clinic was a '*desire to serve the poor and improve society*'. In a Pakistani survey of 300 medical doctors, the '*opportunity to serve people*' was found to be important in both public and private setups (Malik, 2011). In India, De Costa (2008) found that altruism was one of two motivators for collaborating with a government scheme aimed at improving patient welfare. Desquins et al., (2007) estimate

that around 20 percent of doctors adopt *altruistic* behaviors. A review by Ratanawongsa (2006) found three 'sentinel motivators' throughout the careers of doctors, from entering medical school to selecting specialties that best fit their personalities: Of these sentinel motivators '*altruism*' ranked the highest in importance.

Finally, altruism has also been identified among *dentists*. Du Toit et al., (2014) for instance, conducted an international cross-sectional survey of the reasons to choose a career in dentistry with 711 first-year dental students from thirteen countries in six continents. The second greatest motive, identified by 36.3 percent of respondents, was '*I want to be a dentist who helps poor and underprivileged people*.'

4.2 Evidence on physician preferences for incentives from discrete choice experiments

Within Ellis and McGuire's (1986) model, physician altruism interacts with their financial motivation to jointly determine the physician's healthcare provision (see Section 2.2). On the latter motivation some empirical research has been conducted using discrete choice experiments (DCEs). There are a few empirical studies with physician and medical student samples, which aim to identify physicians' financial motivation by applying DCEs. These DCE studies provide some evidence for physicians' responsiveness to financial incentives (Scott, 2001; Rizzo and Zeckhauser, 2003, 2007; Hanson and Jack, 2010).

Vujicic et al. (2010) and Kolstad (2011) used DCEs to fit random utility models to their stated preference data. They found that the marginal utility of income is statistically significant. Scott and Sivey (2013) examined how physicians' characteristics are associated with monetary motivations (measured by the marginal utility of income) and they also directly measured how these characteristics influence physicians' responses to financial incentives.

4.3 Evidence on physician altruism from prescription records

The literature analyzing prescription choices of physicians in primary healthcare provides some empirical evidence on physician altruism (Hellerstein, 1998; Lundin, 2000; Coscelli, 2001; Crea et al., 2014). While Ellis and McGuire (1986) examined a physician deriving utility from hospital profit and patient's health benefit, Hellerstein (1998), Lundin (2000) and Crea et al., (2014) assume that physicians are interested in patient welfare and insurance expenditures. Within this framework, they compare physicians' marginal utility from patient welfare with their marginal disutility from insurance expenditures.

Hellerstein (1998), in particular, developed an altruism model for prescription drugs. In her model, the physician diagnoses the patient, chooses a drug to treat the illness, and faces a choice between branded and generic versions of the drug. The branded version of the drug is assumed to be more expensive that the generic version, which is consistent with empirical facts. Hellerstein (1986) assumes that the physician internalizes the effects of her decision-making on patient's welfare and health insurance expenditures. If γ_p and γ_i denote the degree of the physician's altruism and the private marginal cost of insurance expenditure for the physician, respectively, a more generous insurance induces the doctor to prescribe a branded version of the drug when $\gamma_p > \gamma_i$, that is, when, in her utility function, the physician gives a higher weight to the patient's utility than to insurance expenditure. Later this has been called an ex post moral hazard in the market for prescription drugs (see e.g. Lundin, 2000 and Crea et al., 2014).

Lundin (2000) examined the role of health insurance in the market for prescription drugs using data collected from two pharmacies in Sweden in 1992 and 1993. The probit estimates of the probability that doctors prescribe generic versus branded versions of drugs to their patients gave support for both the altruism and the moral hazard hypotheses. Physicians weigh the patients' benefits from health insurance more than insurance expenditures, which implies that a higher insurance coverage increases (decreases, respectively) the probability of prescribing a branded (generic, respectively) version of a drug.

Crea et al., (2014) utilized pharmaceutical prescriptions data from the Social Insurance Institution in Finland, for the period 2001 to 2011, focusing on lipid modifying agents ('statins'), with a total of 11 564 782 prescriptions. They estimated the probability that doctors prescribe generic versus branded versions of statins for their patients, as a function of the shares of the difference in prices that patients have to pay out of their pocket and that is covered by insurance. Using panel logit models controlling for a wide range of doctors, patients, and drugs characteristics, Crea et al., (2014) found strong support for both the physician altruism and moral hazard hypotheses in Finland.

In these studies, the degree of physician altruism is estimated utilizing the variation of the out-of-pocket payments of patients. Physicians may be less sensitive to patients' out-of-pocket prices than to health benefits obtained from the consumption of pharmaceuticals and, more generally, from healthcare. Other groups of studies focus on estimates of altruism considering the health benefits of patients.

4.4 Evidence on physician altruism from field experiments

Jacobsen et al., (2011) conducted an 'artefactual field experiment' (in the sense of Harrison and List, 2004) where they asked two samples of 88 nursing and 73 real-estate broker students in Norway to play a DG with *Amnesty International* as the recipient. They found that nursing students donated about 75 percent of their endowments, compared to 61 percent of real-estate broker students. When Jacobsen et al., (2011) allowed subjects a 'costly exit' from the game (in the sense of Dana et al., 2006, 2007), nursing students were more likely to choose to opt out, but even accounting for exit behavior, they were more generous than real-estate broker students.

Smith et al., (2012) conducted a set of 'artefactual field experiments' in Kenya, South Africa, and Thailand, where they asked 1 064 final-year nursing students to play a DG. Nursing students chose one of eleven possible ways to split their initial allocation of money, set in a way that the maximum payoff was equivalent to the nurse's daily starting salary. Nursing students played three DGs in which they decided how to divide money between themselves and either a fellow student, or a patient, or a poor person. Nursing students in all the three countries gave about 30 percent of their endowment, and showed greater generosity to patients and the poor than to fellow students. Similar results were found by Kolstad et al., (2012) who also asked two samples of medical and nursing students in Tanzania to play a DG game with a medical or nursing student as recipients.

Serra et al., (2010) conducted another 'artefactual field experiment' in Ethiopia where they asked 219 nursing students and 90 medical students to play a Generalized Trust Game (GTG). In essence, a proposer decided what proportion of their cash endowment to send to a responder. The amount sent was tripled by the experimenter before being passed to the responder, who also received the same initial endowment. Then, the responder was asked to send any portion of the tripled amount to another proposer present at the same time. A measure of 'generalized trustworthiness' was constructed as the sum of four amounts returned by each responder in four rounds of the game, divided by the sum of the four amounts that could have been sent to each responder. Serra et al. (2010) found some correlation between this measure of generalized trustworthiness in the experimental GTG and the self-reported intention to work in the non-profit healthcare sector.

Given the different strategic structures of the GTG, and the DG and UG games, it is unclear whether the results of Serra et al., (2010) could really be interpreted in terms of altruism of nursing and medical doctors. It is also unclear whether the strategic situation modeled in the GTG game and the stated intention of working for the non-profit healthcare sector really captures the same underlying attitudes and constructs. To date, however, the study by Serra et al., (2010) is the only one providing at least some evidence of the external validity of social preferences games in the health context. More systematic evidence is clearly needed on this key point.

4.5 Evidence on physician altruism from laboratory experiments

In contrast to the observational studies discussed above (and to some extent also to field experiments) laboratory experiments enable researchers to explicitly study tradeoffs between patients' health benefit and profit under controlled conditions and using incentivized behavioral data. A further advantage

with respect to field experiments is that, in the laboratory, choice situations can be implemented with trade-offs that closely relate to theoretical models of physician behavior (see Section 2.2).

The first controlled laboratory experiment which implements patient health benefit in an incentivized way is Hennig-Schmidt et al., (2011).[11] In a framed physician decision-making task, medical students chose, in the role of physicians, quantities of medical services, determining both their profit and the health benefit of patients outside the laboratory. Subjects faced a tradeoff as they were unable to maximize the patient's health benefit and their profit at the same time. Monetary values were attached to both the profit and the patient's health benefit. Hennig-Schmidt et al., (2011) aimed to identify the causal effect of variation in the payment system on physicians' quantity choices, while their main focus was not physician altruism.

Godager and Wiesen (2013), however, focused explicitly on physician altruism, and used the marginal rate of substitution (MRS) between patient benefit and profit as a measure of physician altruism. In particular, using the same experimental data from Hennig-Schmidt et al., (2011), they estimated multinomial logit and mixed logit regressions and provided estimates of individual decision-makers' MRS. The results indicate that almost all medical students put a positive weight on patients' health benefit. Godager and Wiesen (2013) also found substantial heterogeneity in the degree of physician altruism. In particular, some medical students attached a higher value to their profit than to the patients' health benefit (26%). The majority of medical students either attached equal weights to profit and health benefit (29%) or put an even higher weight on the patient (44%). In a related experiment, Godager et al., (2014) analyzed how quantity choices were influenced by disclosing outcome information, finding variation in physician altruism similar to that of Godager and Wiesen (2013).

Further, Brosig-Koch et al., (2014a) identify physician altruism by means of an incentivized laboratory experiment in the fashion of Hennig-Schmidt et al.'s (2011) design. They infer physician altruism from subjects' quantity choices for determining profit and patient's health benefit and find that patient benefits have a significant impact on subjects' choices. Similar to Godager and Wiesen (2013), they report substantial heterogeneity in physician altruism. Using the same experimental set up as Hennig-Schmidt et al., (2011), Hennig-Schmidt and Wiesen (2014) report considerable differences between medical students and students from other majors in their altruistic motivation towards a patient. In a recent study, which employs laboratory and artefactual field experiments, Brosig-Koch et al., (2014b) showed that physicians, medical students, and students from other majors respond in a similar way to incentives inherent in fee-for-service and capitation. Physicians exert, however, the highest altruistic motivation in their medical service provision.

[11] Notice that the experimental set up introduced by Hennig-Schmidt et al., (2011) motivated several recent experimental studies investigating incentives for physicians. These experiments analyze, for example, the impact of fee-for-service and capitation systems (Brosig-Koch et al., 2014a), performance pay (Brosig-Koch et al., 2013, Keser and Schnitzler, 2013), mixed payment systems (Brosig-Koch et al., 2014b), and performance information (Kairies-Schwarz and Krieger, 2013; Godager et al., 2014) on physicians' medical service provision.

5 Intrinsic motivation in health care

5.1 General definition

A parallel stream in the health economics literature has focused on the discussion of the role of the 'intrinsic motivation' of physicians and other healthcare professionals. Although conceptually distinct, intrinsic motivation is commonly associated with the notion of altruism. For the sake of completeness, it is thus worthwhile to briefly provide an overview of the key arguments and findings of this parallel stream of literature.

Generally speaking, healthcare professionals, and more generally individuals, are said to be extrinsically motivated when an activity is performed under the 'extrinsic' motivation of receiving a reward or incentive, or of avoiding a punishment. Healthcare professionals can also be subject to intrinsic motivation, in which case an activity has no purpose other than itself. For example, a physician may be interested in providing high-quality health service because of professional ambition[12] and not because of her concern for patient welfare. Traditionally economists have viewed extrinsic incentives as the main, if not the only, motivator of individual behavior (Laffont and Martimort, 2002; Batifoulier and De Silva, 2014).

More recently, however, the behavioral economics and social psychology literatures have highlighted the 'hidden costs' and unintended consequences of financial incentives (Fehr and Falk, 2002; Fehr and List, 2004; Sliwka, 2007), including crowding out of intrinsic motivation (Frey and Oberholzer-Gee, 1997; Deci et al., 1999); changing social norms or individual beliefs about those norms (Gneezy and Rustichini, 2000a,b; Heyman and Ariely, 2004); interacting in unpredictable ways with reciprocity, reputation, and social comparison concerns (Fehr and Gächter, 1997; Ariely et al., 2009a; Rigdon, 2009; Dur et al., 2010; Gächter and Thoni, 2010; Greiner et al., 2011); 'choking' due to the excessive pressure caused by linking incentives to performance (Ariely et al., 2009b); and unintended 'spillover' effects on other non-targeted behaviors (Dolan and Galizzi, 2015). In these cases, financial incentives can actually 'backfire', resulting in overall effects that go in the opposite direction to that originally envisaged (Benabou and Tirole, 2003, 2006; Kamenica, 2012; Dolan and Galizzi, 2014).

In particular, Frey and Oberholzer-Gee (1997) refer for the first time to the phenomenon henceforth known as the 'crowding out of intrinsic motivation' and they describe two psychological accounts for it: i) external motivators such as monetary incentives to induce a specific behavior are perceived as reducing the extent of self-determination, which, in turn, makes individuals feeling 'over justified' if they maintain their intrinsic motivation, leading them therefore to rationally reduce the motivational factor under their control; ii) external motivation in the form of monetary incentives implies that individual competence is unappreciated in itself, which leads to reduced self-esteem, resulting, in turn, in reduced intrinsic motivation.

Early evidence on crowding out and on the negative effects of financial incentives was presented by Deci (1971), who found that students spontaneously played with puzzles, but once they had been paid to solve them, they lost interest in playing for free. Similarly, Frey (1999) found that unpaid volunteers worked longer hours than those offered a small payment. An influential meta-analysis of 128 studies by Deci et al., (1999) indicates that such findings are representative of a consistent body of experimental data, and that the effect of money undermining intrinsic motivation is strongest for complex cognitive tasks.

In the healthcare sector, the introduction of incentives for physicians and other members of staff may be harmful because healthcare professionals may already be intrinsically motivated. In the context of the NHS, for instance, Le Grand (2003) notices that the introduction of pay-for-performance incentives may turn healthcare providers from 'knights' into 'knaves'. The presence of high intrinsic

[12] In that case, the term $\varphi(q)$ in (1.4) would measure the physician's private value of high-quality production of health care.

motivation is in fact the main reason highlighted by the economics and health economics literatures to explain why many healthcare jobs, such as nursing, remain attractive even when they pay relatively low wages. The idea is that more intrinsically motivated but also altruistic individuals self-select into certain jobs or professions (Brekke et al., 2003; Heyes, 2005; Besley and Ghatak, 2006; Prendergast, 2007; Delfgaauw and Dur, 2008; Brekke and Nyborg, 2010).

5.2 Evidence on intrinsic motivation in health care

In what follows, we briefly report the typical findings of the health economics literature, looking at the measurement of intrinsic motivation among physicians and other healthcare professionals. A few studies have attempted to directly measure the extent of 'intrinsic motivation' by surveying samples of physicians. Sicsic et al., (2012), for instance, surveyed intrinsic and extrinsic motivation of French GPs using activities requiring time and for which payment was low as indicators of intrinsic motivators. They report a possible negative relationship between GPs' intrinsic and extrinsic motivation. These measures confirm the difficulty to clearly map intrinsic motivation and altruism, since the former also inevitably includes measures of autonomy, and not just altruism.

Since intrinsic motivation is inherently difficult to measure and isolate, the typical 'identification' strategy undertaken by this stream of the literature revolves around the investigation of whether the introduction of extrinsic motivators, such as financial incentives, leads to a decrease in performance or effort by healthcare professionals. The general message of this part of the literature is that evidence is mixed. A first group of studies provide some evidence that monetary incentives indeed crowd out intrinsic motivation, a finding that points to the conclusion that intrinsic motivation indeed exists among healthcare professionals.

Georgellis et al., (2010), for instance, used data from a large British longitudinal survey to estimate the probability of healthcare professionals transferring from the private to the public sector. They find evidence that extrinsic rewards in the NHS crowd out intrinsic motivation, with higher predicted earnings and satisfaction with extrinsic job characteristics reducing the propensity to transfer to the public sector. Their results, however, showed crowding out among low-wage earners but not high-wage earners.

A number of studies have investigated the effects of Payment for Performance (P4P) schemes in the healthcare sector in both developed and developing countries. P4P schemes offer financial incentives to meet certain performance standards measured by specific indicators. The general finding is that family doctors tend to respond to those financial incentives (Croxson et al., 2001).

Another group of studies fails to find support for the hypothesis that financial incentives lead to crowding out of intrinsic motivation, a finding that is consistent with the belief that healthcare professionals do not exhibit any such construct like intrinsic motivation. The NHS in the UK, for instance, implemented a large scale P4P system for GPs. Gravelle et al., (2010) found that the introduction of the P4P succeeded in its envisaged objectives: In the first year after its introduction, performance against some clinical indicators were above the trend. In a randomized controlled field experiment, Banerjee et al., (2008) found that nurses in India were very responsive to financial incentives, with a dramatic drop in absenteeism of up to 50 percent. In Indonesia, financial performance incentives led to improvements in health outcomes (Olken et al., 2013). Yamada (2013) investigated reasons for the relatively low absence rates among public health workers in Laos compared with other developing countries, and found that delayed payment of wages increased absenteeism. This suggests that a lack of financial incentives deters health workers from attending their workplaces and, if anything, in this case motivation seems to be crowded in, not out. Basinga et al., (2011) and Gertler et al., (2012) examined the effect of performance incentives for health care providers in Rwanda, and found that the quality of prenatal and postnatal medical services significantly increased, with large improvements in child health outcomes.

Finally, a third group of studies finds inconclusive and mixed results on whether the introduction of financial incentives leads to crowding out of intrinsic motivation. In particular, the majority of studies from both developed and developing countries show indeterminate effects of P4P schemes on healthcare outcomes, which imply an ambivalent effect on intrinsic motivation.

Jensen et al., (2013), for instance, found that of nine systematic reviews evaluating a total of 75 primary studies on P4P, only one identified a crowding out of intrinsic motivation due to financial incentives. In primary care Gavadan et al., (2010) found no evidence for a clinically significant effect of financial incentives on performance in preventive care in the US over six years. An accompanying survey revealed that most doctors felt the incentives were not very effective in improving quality of care. A study in Canada of P4P incentives on the provision of targeted primary care services found that responses were modest and that doctors responded to the financial incentives for some services but not for others (Hurley et al., 2014). Barnighausen (2009) conducted a literature review over 4 continents of P4P financial incentives to relocate health workers to underserved rural areas, and concluded that existing evidence does not allow an inference that the programs have led to significant improvement. Van Herck et al., (2010) conducted a systematic review of 128 evaluation studies of P4P programs and found mixed results. Another Cochrane review (Witter et al., 2013) of P4P incentives in low- and middle-income countries to improve delivery of healthcare also yielded mixed results.

6 Discussion and conclusions

We have overviewed the main theoretical notions and empirical findings on altruism of healthcare professionals, and of physicians in particular. The operational definition of altruism in the literature in behavioral and experimental economics typically revolves around the allocation of amounts of money in strategic games such as the DG and the UG. In those games, altruism is defined as the empirical deviation from the purely self-interested allocation of money in the (sub-game perfect) Nash equilibrium of those games.

The theoretical literature in health economics takes account of the peculiarity of the health domain and of the healthcare context, in particular, and it embeds the notion of physician altruism within the doctor–patient relationship. The altruism of physicians (and, more generally, of healthcare professionals) is more specifically defined as the weight within the doctors' utility function attached to patient's health benefit, besides self-interested monetary considerations. This notion is broadly consistent with the parallel, but distinctly widespread view in economics that physicians (and more generally, public servants) are characterized by some degree of 'intrinsic motivation', which leads them to self-select into those jobs, and to exert high effort regardless of 'extrinsic' financial motives.

The empirical literature that has attempted to capture and measure provider and physician altruism can be divided into five streams, which could be ranked from the lowest to the highest degree of control in their empirical strategies. To start with, some studies have tried to isolate altruistic motives by directly asking physicians and healthcare professionals about their own motivations, using interviews and surveys. These findings suggest that altruism appears to be one of the main components of self-reported motivations not only by doctors, by also by medical students, nurses, nursing students, and dentists.

The second stream of literature directly measured physicians' responsiveness to monetary motives using discrete choice experiments (DCEs). The general finding is that physician subjects seem to respond to financial incentives even when these are merely hypothetical, as is typically the case in the DCE scenarios.

Common to these first two streams of the literature is that evidence of altruism is only indirect and mediated, and that responses are not incentivized, in the sense that decisions are not explicitly linked to either real financial rewards, or to real patient health benefits. Three alternative approaches have been attempted to gather evidence that is more closely linked to real decisions by providers and physicians.

A third stream in the literature, in fact, has directly interrogated public records on drugs prescriptions. The identification strategy in these cases has been to take advantage of insurance copayment schemes in the real world where the patients are directly responsible for a share of the costs of pharmaceutical drugs prescribed by their doctors. The share of the costs is typically lower for generic versions of the drugs, and the doctors have no financial incentives in prescribing one or another version of the drugs, so that different patterns of prescriptions allow one to estimate the extent to which physicians behave 'altruistically'. The evidence from this small stream of literature clearly supports the hypothesis of provider altruism. The non-experimental nature of such an empirical analysis, however, does not allow for a tight control for several patient- or doctor-specific factors that can also potentially relate to different drug prescription patterns. Therefore, in order to account for individual heterogeneity and provide reliable findings, this approach typically requires millions of independent doctor–patient records.

A further stream in the literature has directly measured altruism using 'artefactual field experiments' where samples of real nurses (or nursing students) have played games such as DG and UG. The general message is that in those games nurses seem to behave altruistically, and tend to do so more often than comparable samples of non-healthcare professionals. Given the substantial lack of tests on their external validity in the health context, however, it is unclear whether the inherent nature of the DG and UG strategic games with monetary rewards really represent the closest possible match to health-related provider altruism, as developed by the theory.

The final stream of the literature has, in fact, attempted to closely replicate the conditions of the theoretical models in laboratory experiments: Typically medical students take decisions under con-

trolled conditions that have real monetary incentives and real consequences for patient benefits. The general findings of this controlled set of experiments strongly support the theoretical predictions that physicians largely behave 'altruistically' in their healthcare decisions.

Finally, it is worth mentioning that a parallel stream in the literature has attempted to isolate the related but conceptually distinct concept of provider intrinsic motivation. This literature has also used a variety of different methods. A first group of such studies has used a survey methodology and directly asked healthcare professionals to self-report their motivating factors in surveys and questionnaires. A second group of such studies has explored an alternative pathway: Since intrinsic motivation is inherently difficult to access directly, some studies have attempted to indirectly detect it from changes in the level of performances following the introduction of financial incentives. The underlying idea is that performance-based financial incentives crowd out the existing intrinsic motivation. In general, the findings from the empirical literature on intrinsic motivation are mixed, and do not allow us to draw any conclusive mapping of the findings into the typical framework of provider altruism developed by the theoretical literature.

In sum, while the general message is that rigorous evidence is rapidly accumulating in support of the hypothesis of physicians and providers altruism, more research is needed to systematically map and integrate the empirical findings from various streams of the literature and to identify which patterns of evidence are robust across different contexts, settings, domains, and methodologies.

References

Allaby, M.A.K., 2003. Doctors for the poor in urban Nepal, *Tropical Doctor*, 33(2), 83-85.

Allard, M., Jelovac, I., Léger, P., 2011. Treatment and Referral Decisions under Different Physician Payment Mechanisms. *Journal of Health Economics,* 30, 880–893.

Anderson, O., Galizzi, M.M., Hoppe, T., Kranz, S., Wengstrom, E., Van der Viel, K., 2010. Persuasion in Experimental Ultimatum Games. *Economic Letters*, 108(1), 16-18.

Andreoni, J., 1988. Privately provided public goods in a large economy: The limits of altruism. *Journal of Public Economics*, 35, 57-73.

Andreoni, J., 1989. Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy,* 97 (6): 1447–1458. doi:10.1086/261662

Andreoni, J. and Bernheim, B. D., 2009. Social image and the 50–50 norm: a theoretical and experimental analysis of audience effects. *Econometrica*, 77 , pp. 1607–1636

Andreoni, J., Harbaugh, W.T. and Vesterlund, L., 2008. Altruism in experiments, The New Palgrave Dictionary of Economics, 2008 edition.

Andreoni, J., and Miller, J.H., 2002. Giving according to GARP: An experimental test of the consistency of preferences for altruism. *Econometrica*, 70, 737-753.

Ariely D., Bracha A. and Meier, S., 2009a. Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, 99, 544-555.

Ariely, D., Gneezy, U., Loewenstein, G. and Mazar, N., 2009b, Large Stakes and Big Mistakes. *Review of Economic Studies*, 76, 451-469.

Arrow, K.J., 1963. Uncertainty and the welfare economics of medical care. *American Economic Review*, LIII(5), 941-973.

Banerjee, A., Glennerster, R., Duflo, E., 2008. Putting a band-aid on a corpse: incentives for nurses in the Indian public health care system. *Journal of the European Economic Association*, 6(2-3), 587-500.

Bardsley, N., 2005. Experimental Economics and the Artificiality of Alteration. *Journal of Economic Methodology*, 12(2), 293-51.

Bardsley, N., 2008. Dictator game giving: altruism or artefact? *Experimental Economics*, 11: 122–133, DOI 10.1007/s10683-007-9172-2.

Barr, A., and Serneels, P., 2009. Reciprocity in the workplace. *Experimental Economics*, 12(1), 99-112.

Barr, A., and Zeitlin, A., 2010. Dictator games in the lab and in nature: external validity tested and investigated in Ugandan primary schools. CSAE Working Paper 2010-11.

Batifoulier, P., Da Silva, N., 2014. Medical altruism in mainstream health economics: theoretical and political paradoxes. *Review of Social Economy*, 72(3), 261-279.

Bellemare, C., Kroger, S., 2007. On representative social capital. *European Economic Review*, 51, 183-202.

Benabou, R., and Tirole, J., 2003. Intrinsic and Extrinsic Motivation. *Review of Economic Studies,* 70 (3), 489-520.

Benabou, R., and Tirole, J., 2006. Incentives and Prosocial Behaviour. *American Economic Review*, 96(5), 1652-78.

Benabou, R., and Tirole, J., 2011. Identity, Morals, and Taboos: Beliefs as Assets. *Quarterly Journal of Economics*, 126, 805-855.

Benz, M. and Meier, S., 2008. Do people behave in experiments as in the field? Evidence from donations. *Experimental Economics*, 11, 268-281.

Berg, J., Dickhaut, J.W., and McCabe, K.A., 1995. Trust, reciprocity, and social history. *Games and Economic Behavior*, 90, 166-93.

Besley, T., Ghatak, M., 2005. Competition and incentives with motivated agents. *American Economic Review*, 95(3), 616-636.

Bicchieri, C. and Xiao, E., 2010. Do the Right Thing: But only if Others Do so. *Journal of Behavioral Decision Making*, 22, 191-208.

Brañas-Garza, P., 2006. Poverty in Dictator Games: Awakening Solidarity. *Journal of Economic Behavior and Organization*, 60, 306-320.

Brañas-Garza, P., 2007. Promoting Helping Behavior with Framing in Dictator Games. *Journal of Economic Psychology*, 28, 477-486.

Brekke, K.A., Kverndokk, S., Nyborg, K., 2003. An economic model of moral motivation. *Journal of Public Economics*, 87(9-10), 1967-1983.

Brekke, K.A., Nyborg, K., 2010. Selfish bakers, caring nurses? A model of work motivation. *Journal of Economic Behavior and Organization*, 75(3), 377-394.

Brosig-Koch, J., Hennig-Schmidt, H., Kairies, N., Wiesen, D., 2013. How Effective are Pay-for-performance Incentives for Physicians? A Laboratory Experiment, working Paper, Ruhr Economic Papers, No. 413.

Brosig-Koch, J., Hennig-Schmidt, H., Kairies-Schwarz, N., Wiesen, D. 2014a. The effects of introducing mixed payment systems for physicians: Experimental evidence. Working paper, University of Cologne.

Brosig-Koch, J., Hennig-Schmidt, H., Kairies-Schwarz, N., Wiesen, D. 2014b. Using artefactual field and lab experiments to investigate how fee-for-service and capitation affect medical service provision. HERO Working Paper Series 2014:3.

Cadsby, C.B., Maynes, E., 1998. Choosing between a socially efficient and free-riding equilibrium: nurses versus economics and business students. *Journal for Economic Behavior and Organization*, 37(2), 183-192.

Camerer, C., 2003. Behavioral Game Theory: Experiments in Strategic Interaction. Princeton University Press.

Camerer, C.F., 2011. The promise and success of lab-field generalizability in experimental economics: A critical reply to Levitt and List. SSRN working paper.

Camerer, C.F., Hogarth, R.M., 1999. The Effects of Financial Incentives in Experiments: a Review and Capital-Labor-Production Framework. *Journal of Risk and Uncertainty*, 19 (1-3), 7-42.

Camerer, C. Thaler, R., 1995. Anomalies: Ultimatums, dictators and manners. *Journal of Economic Perspectives*, 9, 209-219.

Cappelen, AW, Nielsen, UH, Sørensen, EØ, Tungodden, B & Tyran, J-R.K., 2013, Give and Take in Dictator Games. *Economics Letters*, vol 118, no. 2, pp. 280–283.

Cappelen, AW, Sørensen, EØ, Tungodden, B., 2010. Responsibility for what? Fairness and individual responsibility. European *Economic Review,* 54, 429-441.

Carpenter, J.P., Connolly, C., and Myers, C.K., 2008. Altruistic behavior in a representative dictator experiment. *Experimental Economics*, 11, 282-298.

Carpenter, J.P., and Myers, C.K., 2010. Why volunteer? Evidence on the role of altruism, reputation, and incentives. *Journal of Public Economics*, 94, 911-920.

Castillo, M., and Carter, M.R., 2002. The economic impacts of altruism, trust and reciprocity: an experimental approach to social capital. AAE Staff Papers, University of Wisconsin-Madison.

Chalkley M and Malcolmson J.M., 1998. Contracting for health services when patient demand does not reflect quality. *Journal of Health Economics*, 17(1), 1-19.

Charness, G. and Rabin, M., 2002. Understanding social preferences with simple tests. *Quarterly Journal of Economics*, 117, 817-69.

Cherry, T., Frykblom, P. and Shogren, J., 2002. Hardnose the Dictator. *American Economic Review* 92, 1218–1221.

Chone, P., Ma, C-to A., 2011. Optimal health care contract under physician agency. *Annals of Economics and Statistics*, 102, 229-256.

Crea, G., Galizzi M.M., Hokkanen J., Linnosmaa I., Miraldo M., 2015. Doctor's altruism and moral hazard: Evidence from Finnish prescription records, National Institute for Health and Welfare, Discussion paper, forthcoming.

Croxson, B., Propper, C., Perkins, A., 2001. Do doctors respond to financial incentives? UK family doctors and the GP fundholder scheme. *Journal of Public Economics*, 79, 357-398.

Dana, J.R., Cain, D., Dawes, R., 2006. What you don't know won't hurt me: costly (but quiet) exit in dictator game. O*rganizational Behavior and Human Decision Processes*, 100, 193-201.

Dana, J.R., Weber, R., Kuang, J., 2007. Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. *Economic Theory*, 33, 67-80.

Deci, E.L., 1971. Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, 12(11), 1333-1335.

Deci, E.L., Koestner, R.M., and Ryan, R., 1999. A Meta-Analytic Review of Experiments Examining the Effect of Extrinsic Rewards on Intrinsic Motivation. *Psychological Bulletin*, 125, 627-668.

Delfgaauw, J., Dur, R., 2008. Incentives and workers' motivation in the public sector. *Economic Journal*, 118(525), 171-191.

Dolan, P., Galizzi, M.M., 2015. Like Ripples on a Pond: Behavioural Spillovers and Their Consequences for Research and Policy. *Journal of Economic Psychology*, 47, 1-16.

Dolan, P., Galizzi, M.M., 2014. Getting Policy-Makers to Listen to Field Experiments. *Oxford Review of Economic Policy*, 30(4), forthcoming.

Dur, R., Non, A. and Roelfsema, H., 2010. Reciprocity and incentive pay in the workplace. *Journal of Economic Psychology*, 31**,** 676-686.

Eckel, C. abd Grossman, P., 1996. Altruism in Anonymous Dictator Games. *Games and Economic Behavior*, Elsevier, 16, 181-191.

Ellis R.P and McGuire T.G., 1986. Provider behavior under prospective reimbursement. *Journal of Health Economics*, 5, 129-151

Engel, C., 2011. Dictator Games: A Meta Study. *Experimental Economics*, vol. 14(4), pages 583-610.

Fagermoen, M.S., 1997. Professional identity: values embedded in meaningful nursing practice. *Journal of Advanced Nursing*, 25(3), 434-441.

Falk, A., and Kosfeld, M., 2006. The Hidden Costs of Control. *American Economic Review*, 96 (5), 1611-30.

Falk, A., Meier, S., and Zehnder, C., 2013. Do lab experiments misrepresent social preferences? The case of self-selected student samples. *Journal of the European Economic Association*, 11(4), 839-852.

Falk, A. and Heckman, J., 2009. Lab experiments are a major source of knowledge in the social sciences. *Science*, 326, 535-538.

Fehr, E., and Falk, A., 2002. Psychological Foundations of Incentives. *European Economic Review*, 46, 687-724.

Fehr, E. and Gächter, S., 1997. Reciprocity as a contract enforcement device: Experimental evidence. *Econometrica*, 65, 833-860.

Fehr, E. and Gächter, S., 2000. Cooperation and punishment in public goods experiments. *American Economic Review*, 90, 980-994.

Fehr, E., and List, J., 2004. The Hidden Costs and Returns of Incentives. The Hidden Costs and Returns of Incentives: Trust and Trustworthiness Among CEOs. *Journal of the European Economic Association*, 2(5), 743-71.

Fehr, E. and Schmidt, K., 1999. A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, 114, 173-68.

Farley, P. J., 1986. Theories of the price and quantity of physician services: A synthesis and critique. *Journal of Health Economics* 5, 315–333.

Fehr, E. and Schmidt, K., 2006. The Economics of Fairness, Reciprocity and Altruism - Experimental Evidence and New Theories, Handbook on the Economics of Giving, Reciprocity and Altruism.

Fehr, E. and Gächter, S., 2000. Cooperation and Punishment in Public Goods Experiments. *American Economic Review*, 90, No. 4, pp. 980-994.

Fischbacher, U., and Gächter, S., 2010. Social preferences, beliefs, and the dynamics of free riding in public good experiments. *American Economic Review,* 100, 541-556.

Fong, C., 2007. Evidence from an Experiment on Charity to Welfare Recipients: Reciprocity, Altruism and the Empathic Responsiveness Hypothesis. Economic Journal, 117, 1008-1024.

Forsythe, R., Horowitz, J.L., Savin, N.E., and Sefton, M., 1994. Fairness in Simple Bargaining Experiments. *Games and Economic Behavior*, 6, 347-369.

Franzen, A., Pointner, S., 2012. Anonymity in the dictator game revisited. *Journal of Economic Behavior and Organization*, 81(1), 74-81.

Franzen, A. and Pointner, S., 2013. The external validity of giving in the dictator game: A field experiment using the misdirected letter technique. *Experimental Economics*, 16, 155-169.

Frey, B.S., and Oberholzer-Gee, F., 1997. The Cost of Price Incentives: an Empirical Analysis of Motivation Crowding-out. *American Economic Review*, 87 (4), 746-55.

Gächter, S. and Thoni, C., 2010. Social comparison and performance: Experimental evidence on the fair wage-effort hypothesis. *Journal of Economic Behavior & Organization*, 76, 531-543.

Galizzi, M.M., Navarro-Martinez, D., 2015. On the external validity of social-preference games: a systematic lab-field study. Barcelona Graduate School of Economics Working Paper 802.

Georgellis, Y., Iossa, E., Tabvuma, V., 2010. Crowding out intrinsic motivation in the public sector. *Journal of Public Administration Research and Theory*, 21, 473-493.

Gneezy, U., and List, J.A., 2013. The Why Axis. Random House Business, New York.

Gneezy, U., Meier, S., and Rey-Biel, P., 2011. When and Why Incentives (Don't) Work to Modify Behaviour. *Journal of Economic Perspectives*, 25 (4), 191-210.

Gneezy, U., and Rustichini, A., 2000a. Pay Enough Or Don't Pay At All. *Quarterly Journal of Economics*, 115 (3), 791-810.

Gneezy, U., and Rustichini, A., 2000b. A Fine Is a Price. *Journal of Legal Studies*, 29 (1), 1-18.

Godager, G., Iversen, T., Ma, C.-.T.A. 2009. Service motives and profit incentives among physicians. *International Journal of Health Care Finance and Economics*, 9(1), 39-57.

Godager, G. and Wiesen D., 2013. Profit or patients' health benefit? Exploring the heterogeneity in physician altruism. *Journal of Health Economics*, 32(6) 1105-1116.

Godager, G, Heike Hennig-Schmidt, and Tor Iversen. 2014. Does performance disclosure influence physicians' medical decisions? An experimental study. HERO Working Paper 2014:4.

Gonzàlez Gutièrrez, J.L., Penacoba Puente, C., Moreno Rodriguez, R., Lopez Lopez A., Velasco Furlong, L., 2006. Nursing motives for helping scale (N-MHS): reliability and validity. *Spanish Journal of Psychology*, 9(1), 103-112.

Gravelle, H., Sutton, M., Ma, A., 2010. Doctor behaviour under a pay for performance contract: treating, cheating, and case finding? *The Economic Journal*, 120, F129-156.

Greiner, B., Ockenfels, A. and Werner, P., 2011. Wage transparency and performance: A real-effort experiment. *Economics Letters*, 111, 236-238.

Guala, F. and Mittone, L., 2010. Paradigmatic Experiments: The Dictator Game. *The Journal of Socio-Economics*, 39, 578-584.

Gui, B. and Sugden, R., 2005. Why interpersonal relations matter for economics? in Gui, b. and Sugden, R. (Eds.), Economics and Social Interaction: Accounting for interpersonal relations, Cambridge: Cambridge University Press.

Güth, W., Schmittberger, and Schwarze, 1982. An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior and Organization* 3 (4): 367–388. doi:10.1016/0167-2681(82)90011-7.

Hanson, K., Jack, W., 2010. Incentives could induce Ethiopian doctors and nurses to work in rural settings. *Health Affairs* 29 (8), 1452–1460.

Harrison, G.W., List, J.A., 2004. Field experiments. *Journal of Economic Literature*, 42, 1009-1055.

Hellerstein, J., 1988. The importance of the physician in the generic versus trade-name prescription decision. *RAND Journal of Economics*, 29(1), 108-136

Hennig-Schmidt, H, Selten R. and Wiesen D., 2011. How payment systems affect physician's provision behaviour – an experimental investigation, *Journal of Health Economics*, 30(4), 637-646.

Hennig-Schmidt, H., Wiesen, D., 2014. Other-regarding behavior and motivation in health care provision: an experiment with medical and non-medical students. *Social Science and Medicine*, 108, 155-165.

Herrmann, B., Thoni, C. and Gächter, S., 2008. Anti-social punishment across societies. *Science*, 319, 1362-1367.

Heyes, A.G., 2005. The economics of vocation. *Journal of Health Economics*, 24, 561-569.

Heyman, J., and Ariely, D., 2004. Effort for Payment: a Tale of Two Markets. *Psychological Science*, **15** (11), 787-93.

Hoffman, E., McCabe, K., Shachat, K. and Smith, V., 1994. Preferences, Property Rights, and Anonymity in Bargaining Games. *Games and Economic Behavior* 7, 346-380.

Hoffman, E., McCabe, K. and Smith, V. 1996. Social Distance and Other-regarding Behavior in Dictator Games. *American Economic Review* 86, 653-690.

Hurley, J., DeCicca, P., Li, J., Buckley, G., 2014. The response of Ontario Primary Care Physicians to Pay-for-Performance Incentives. *Health Economics*, 23, 962-978.

Jack, W., 2005. Purchasing health care services from providers with unknown altruism, *Journal of Health Economics*, 24(1), 73-93

Jakiela, P., 2011 Social Preferences and Fairness Norms as Informal Institutions: Experimental Evidence. *American Economic Review*, 101, 509–13.

Jakobsen, K.J., Eika, K.H., Helland, L., Lind, J.T., Nyborg, K., 2011. Are nurses more altruistic than real estate brokers? *Journal of Economic Psychology*, 32(5), 818-831.

Jensen, S.O., Amelung, V.E., Hermanowski, T.R., Krauth, C., 2013. Financial incentives in health care: evidence of unintended consequences. *Value in Health*, 16(7), 463.

Jones, R., 2002. Declining altruism in medicine: Understanding medical altruism is important in workforce planning. *British Medical Journal,* 324(7338), 624.

Kaarboe, O.M and Siciliani L., 2011. Multitasking, quality and pay for performance. *Health Economics*, 20(2) 225-238

Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. 1986. Fairness as a Constraint on Profit Seeking: Entitlements in the Market. *American Economic Review*, 76: 728–41.

Kairies, N., Krieger, M., 2013. How do non-monetary performance incentives for physicians affect the quality of medical care? A laboratory experiment, working Paper, Ruhr Economic Papers, No. 414.

Kamenica, E., 2012. Behavioural Economics and Psychology of Incentives. *Annual Review of Economics,* 4 (13), 1-26.

Keser, C., Schnitzler, C. 2013. Money talks: Paying physicians for performance, Discussion Papers, Center for European Governance and Economic Development Research, No. 173.

Kolm, S.-C. (2005) The logic of good social relations, in Gui, b. and Sugden, R. (eds.), Economics and Social Interaction: Accounting for interpersonal relations, Cambridge: Cambridge University Press.

Kolstad, J. R., 2011. How to make rural jobs more attractive to health workers. Findings from a discrete choice experiment in Tanzania. *Health Economics* 20,196–211.

Kolstad, J.R., Lindkvist, I. 2013. Pro-social preferences and self-selection into the public health sector: evidence from an economic experiment. *Health Policy and Planning*, 28(3), 320-327.

Larson, T., Capra, C.M., 2009. Exploiting moral wiggle room: illusory preference for fairness? A comment. *Judgment and Decision Making*, 4, 467-474.

LeGrand, J., 2003. *Motivation, Agency, and Public Policy: of Knights and Knaves, Pawns, and Queens*. Oxford University Press, Oxford.

Levine, D., 1998. Modeling altruism and spitefulness in experiments. *Review of Economic Dynamics*, 1:593-622.

Levitt, S., and List, J., 2007a. What Do Laboratory Experiments Measuring Social Preferences Reveal About the Real World? *Journal of Economic Perspectives*, 21(2), 153-74.

Levitt, S., and List, J., 2007b. On the Generalizability of Lab Behaviour in the Field. *Canadian Journal of Economics*, 40 (2), 343-370.

List, J., 2007. On the Interpretation of Giving in Dictator Games. *Journal of Political Economy*, 115.482-493.

List, J.A., 2009. Social preferences: Some thoughts from the field. *Annual Review of Economics*, 1, 563-579.

Liu, T., Ma, C. A., 2013. Health insurance, treatment plan, and delegation to altruistic physician. *Journal of Economic Behavior & Organization* 85 (0), 79 – 96.

Lundin D., 2000. Moral hazard in physician prescription behavior. *Journal of Health Economics*, 19, 639-662

Makris, M. and Siciliani L., 2013. Optimal incentive schemes for altruistic providers. *Journal of Public Economic Theory* 15(5), 675-699.

Ma, C. A., 1994. Health Care Payment Systems: Cost and Quality Incentives. *Journal of Economics and Management Strategy* 3, 93–112.

Ma, C. A., Riordan, M. H., 2002. Health Insurance, Moral Hazard and Managed Care. *Journal of Economics and Management Strategy* 11, 81–107.

McGuire, T. G., 2000. Physician Agency. In: Cuyler, Newhouse (Eds.), Handbook of Health Economics, Vol. 1 A. North-Holland, Amsterdam (The Netherlands), pp. 461–536.

Murray, T.H., 2003. Are we better than we can say? Altruism in general practice. *British Journal of General Practice*, 53(490), 355-357.

Nagel, T., 1970. The Possibility of Altruism. Oxford: Clarendon Press.

Ortmann, A., Fitzgerald, J., and Boeing, C., 2000. Trust, reciprocity, and social history: A re-examination. *Experimental Economics*, 3, 81-100.

Pawlikowski, J., Sak, J.J., and Marczewski, K., 2012. Physicians' religiosity and attitudes towards patients. *Annals of Agricultural and Environmental Medicine*, 19(3), 503-507.

Penner , L.A., Fritzsche, B.A., Craiger, J.P., and Freifeld, T.R., 1995. Measuring prosocial personality. In J. Butcher, and C.D. Spielberger (Eds). *Advances in Personality Assessment* (Vol. 10, pp. 147-164). New York: Springer-Verlag.

Prendergast, C., 2007. The motivation and bias of bureaucrats. *American Economic Review*, 97(1), 180-196.

Reinikka, R., Svensson, J., 2010. Working for God? Evidence from a change in financing of nonprofit health care providers in Uganda. *Journal of the European Economic Association*, 8(6), 1159-1178.

Rizzo, J. A., Zeckhauser, R. J., 2003. Reference incomes, loss aversion, and physician behavior. *Review of Economics and Statistics* 85 (4), 909–922.

Rizzo, J. A., Zeckhauser, R. J., 2007. Pushing incomes to reference points: Why do male doctors earn more? *Journal of Economic Behavior & Organization* 63 (3), 514–536.

Schweitzer, M., Solnick, S., 1999. The influence of physical attraction and gender on Ultimatum Game decisions. *Organizational Behavior and Human Decision Processes*, 79, 199-215.

Scott, A., 2001. Eliciting gps' preferences for pecuniary and non-pecuniary job characteristics. *Journal of Health Economics* 20, 329–348.

Scott, A., Sivey, P., 2013. Measuring the monetary motivation of physicians, Working paper, University of Melbourne.

Serneels, P., Montalvo, J.G., Petterson, G., Lievens, T., Butera, J.D., Aklilu, K., 2010. Who wants to work in a rural health post? The role of intrinsic motivation, rule background and faith-based institutions in Ethiopia and Rwanda. *Bulletin of the World Health Organization*, 88(5), 342-349.

Serra, D., Serneels, P., and Barr, A., 2010. Intrinsic motivations and the non-profit health sector: Evidence from Ethiopia. CSAE Working Paper 2010-04.

Servátka, M., 2010. Does Generosity Generate Generosity? An Experimental Study of Reputation Effects in a Dictator Game. *Journal of Socio-Economics*, 39, 2010, 11-17.

Siciliani, L., 2009. Paying for Performance and Motivation Crowding Out. *Economics Letters* 103 (2), 68—71.

Sicsic, J., Vaillant, M.I., Franc, C., 2012. Intrinsic and extrinsic motivations in primary care: an explanatory study among French general practitioners. *Health Policy*, 108(2-3), 140-148.

Sliwka, D., 2007. Trust as a signal of a social norm and the hidden costs of incentive schemes. *American Economic Review*, 97(3), 999-1012.

Smith, R., Lagarde, M., Blaauw, D., Goodman, C., English, M., Mullei, K., Pagaiya, N., Tangcharoensathien, V., Erasmus, E., and Hanson, K., 2013. Appealing to altruism: an alternative strategy to address the health workforce crisis in developing countries? *Journal of Public Health*, 35(1), 164-170.

Vujicic, M., Alfano, M., Shengalia, B., Witter, S., 2010. Attracting doctors and medical students to rural vietnam: Insights from a discrete choice experiment. HNP Discussion Paper. Washington, DC: World Bank.

Whynes, D. K., Ennew, C. T., Feighan, T., 1999. Entrepreneurial attitudes of primary health care physicians in the united kingdom. *Journal of Economic Behavior & Organization* 38 (3), 331–347.

Woodward, R. S., Warren-Boulton, F., 1984. Considering the Effect of Financial Incentives and Professional Ethics on 'Appropriate' Medical Care. *Journal of Health Economics* 3, 223–237.

Xiao, E., Houser, D., 2005. Emotion expression in human punishment expression. *Proceedings of the National Academy of Science*, 102(20), 7398-401.

Zhang, L. and Ortman, A., 2014. The effects of the take-option in dictator-game experiments: a comment on Engel's (2011) meta-study, *Experimental Economics*, 17:414–420, DOI 10.1007/s10683-013-9375-7

Zizzo, D.J., 2010. Experimenter Demand Effects in Economic Experiments. *Experimental Economics*, **13**, 75-98.

Zizzo, D.J., 2011. Do Dictator Games Measure Altruism? Handbook on the Econoomics of philanthropy, reciprocity and social enterprice, Luigino Bruni and Stefano Zamagni (eds.), Edward Elgar.